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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,989	06/30/2000	Tinku Acharya	042390.P8762	1436

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EXAMINER
RAO, ANAND SHASHIKANT

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/608,989	ACHARYA ET AL.	
	Examiner	Art Unit	
	Andy S. Rao	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-6 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7 rejected under 35 U.S.C. 102(b) as being anticipated by Dachiku et al., (hereinafter referred to as "Dachiku").

Dachiku discloses a method of video coding the movement of a face from a sequence of images, comprising: selecting a limited number of feature points from an image of the face (Dachiku: column 10, lines 59-64) whose movement is to be video coded (Dachiku: column 11, lines 40-45); estimating spatio-temporal rates of change in the intensity at the selected feature points (Dachiku: column 10, lines 30-40) using at least two images from the sequence (Dachiku: column 9, lines 45-55); estimating translation and rotation of the face using the feature points and using the estimated spatio-temporal rates (Dachiku: column 20, lines 15-25); and coding the estimating translation and rotation (Dachiku: column 11, lines 20-30), as in claim 1.

Regarding claim 2, Dachiku discloses using triangular patches (Dachiku: column 10, lines 15-25), as in the claim.

Regarding claim 3, Dachiku discloses selecting a feature point from each triangular patch (Dachiku: column 10, lines 45-50), as in the claim.

Regarding claim 4, Dachiku discloses estimating using a least mean square's estimation method (Dachiku: column 13, lines 40-50), as in the claim.

Dachiku discloses a method of video coding the movement of a face from a sequence of images, comprising: coding the head (Dachiku: column 10, lines 60-65) from at least one of the images based (Dachiku: column 11, lines 40-45), at least in part, on a limited number of selected features points (Dachiku: column 10, lines 45-50) employing a three dimensional based coding technique to produce a three dimensional (3D) model (Dachiku: column (Dachiku: column 11, lines 40-45); and estimating the movement of the head in the other images of the sequence using the 3D model of the head (Dachiku: column 10, lines 10-15) as in claim 5.

Regarding claim 6, Dachiku discloses treating the 3D model as a rigid body (Dachiku: column 11, lines 1-7), as in the claim.

Regarding claim 7, Dachiku discloses that the movement of the head is estimated as translations and rotations based in part on estimates of spatio-temporal rates of change in intensity at the selected feature points (Dachiku: column 10, lines 30-40), as in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dachiku et al., (hereinafter referred to as "Dachiku") in view of Kang.

Dachiku discloses a system of video coding the movement of a face from a sequence of images, by: selecting a limited number of feature points from an image of the face (Dachiku: column 10, lines 59-64) whose movement is to be video coded (Dachiku: column 11, lines 40-45); estimating spatio-temporal rates of change in the intensity at the selected feature points (Dachiku: column 10, lines 30-40) using at least two images from the sequence (Dachiku: column 9, lines 45-55); estimating translation and rotation of the face using the feature points and using the estimated spatio-temporal rates (Dachiku: column 20, lines 15-25); and coding the estimating translation and rotation (Dachiku: column 11, lines 20-30), as in claim 8. However, Dachiku fails to discloses an imager and computing platform being coupled to communicate electronically, wherein said computing platform being adapted so that, in operation, the movement of a face from a sequence of images is coded, as in claim 8. Kang discloses an imager (Kang: column 3,lines 20-40) and computing platform being coupled to communicate electronically (Kang: column 3, lines 45-60), wherein said computing platform being adapted so that, in operation, the movement of a face from a sequence of images is coded (Kang: column 4, lines 60-67) with the added advantage of a hands-free navigation system (Kang: column 3, lines 29-31). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in art to modify Dachiku's system by implementing it on the imager and computing platform of

Kang in order to achieve a hands-free navigational capacity. The Dachiku system, now implemented on the imager and computing platform of Kang has all of the features of claim 8.

Regarding claim 9, the Dachiku system, now implemented on the imager and computing platform of Kang discloses using triangular patches (Dachiku: column 10, lines 15-25), as in the claim.

Regarding claim 10, the Dachiku system, now implemented on the imager and computing platform of Kang discloses selecting a feature point from each triangular patch (Dachiku: column 10, lines 45-50), as in the claim.

Regarding claim 11, the Dachiku system, now implemented on the imager and computing platform of Kang discloses estimating using a least mean square's estimation method (Dachiku: column 13, lines 40-50), as in the claim.

Dachiku discloses a system of video coding the movement of a face from a sequence of images, comprising: coding the head (Dachiku: column 10, lines 60-65) from at least one of the images based (Dachiku: column 11, lines 40-45), at least in part, on a limited number of selected features points (Dachiku: column 10, lines 45-50) employing a three dimensional based coding technique to produce a three dimensional (3D) model (Dachiku: column (Dachiku: column 11, lines 40-45); and estimating the movement of the head in the other images of the sequence using the 3D model of the head (Dachiku: column 10, lines 10-15) as in claim 12. However, Dachiku fails to discloses an imager and computing platform being coupled to communicate electronically, wherein said computing platform being adapted so that, in operation, the movement of a face from a sequence of images is coded, as in claim 12. Kang discloses an imager (Kang: column 3,lines 20-40) and computing platform being coupled to communicate

electronically (Kang: column 3, lines 45-60), wherein said computing platform being adapted so that, in operation, the movement of a face from a sequence of images is coded (Kang: column 4, lines 60-67) with the added advantage of a hands-free navigation system (Kang: column 3, lines 29-31). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in art to modify Dachiku's system by implementing it on the imager and computing platform of Kang in order to achieve a hands-free navigational capacity. The Dachiku system, now implemented on the imager and computing platform of Kang has all of the features of claim 12.

Regarding claim 13, the Dachiku system, now implemented on the imager and computing platform of Kang discloses treating the 3D model as a rigid body (Dachiku: column 11, lines 1-7), as in the claim.

Regarding claim 14, the Dachiku system, now implemented on the imager and computing platform of Kang discloses that the movement of the head is estimated as translations and rotations based in part on estimates of spatio-temporal rates of change in intensity at the selected feature points (Dachiku: column 10, lines 30-40), as in the claim.

6. Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dachiku et al., (hereinafter referred to as "Dachiku") in view of Kang and further in view of Szeliski et al., (hereinafter referred to as "Szeliski").

Dachiku discloses a system of video coding the movement of a face from a sequence of images, by: selecting a limited number of feature points from an image of the face (Dachiku: column 10, lines 59-64) whose movement is to be video coded (Dachiku: column 11, lines 40-45); estimating spatio-temporal rates of change in the intensity at the selected feature points (Dachiku: column 10, lines 30-40) using at least two images from the sequence (Dachiku:

column 9, lines 45-55); estimating translation and rotation of the face using the feature points and using the estimated spatio-temporal rates (Dachiku: column 20, lines 15-25); and coding the estimating translation and rotation (Dachiku: column 11, lines 20-30), as in claim 15. However, Dachiku fails to discloses an imager and computing platform being coupled to communicate electronically, and an article comprising a storage medium having stored instructions thereon, which when executed by the computing platform result in the movement of a face from a sequence of images being coded, as in claim 15. Kang discloses an imager (Kang: column 3,lines 20-40) and computing platform being coupled to communicate electronically (Kang: column 3, lines 45-60), wherein said computing platform being adapted so that, in operation, the movement of a face from a sequence of images is coded (Kang: column 4, lines 60-67) with the added advantage of a hands-free navigation system (Kang: column 3, lines 29-31). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in art to modify Dachiku's system by implementing it on the imager and computing platform of Kang in order to achieve a hands-free navigational capacity. The Dachiku system, now implemented on the imager and computing platform of Kang has a majority of the features of claim 15. However, the Dachiku-Kang combination fails to address having an article comprising a storage medium having stored instructions thereon, which when executed by the computing platform result in the movement of a face from a sequence of images being coded. Szeliski discloses an article comprising a storage medium having stored instructions thereon (Szeliski: column 8, lines 25-35), which when executed by the computing platform result in the movement of a face from a sequence of images being coded in order to efficiently produce parameter motion models (Szeliski: column 10, lines 25-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in

the art to further incorporate the Szeliski article comprising a storage medium having stored instructions thereon with the Dachiku-Kang combination in order to efficiently produce parameter motion models for the Dachiku system (Dachiku: column 20, lines 15-25). The Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon, has all of the features of claim 15.

Regarding claim 16, the Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon, discloses using triangular patches (Dachiku: column 10, lines 15-25), as in the claim.

Regarding claim 17, the Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon, discloses selecting a feature point from each triangular patch (Dachiku: column 10, lines 45-50), as in the claim.

Regarding claim 18, the Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon, discloses estimating using a least mean square's estimation method (Dachiku: column 13, lines 40-50), as in the claim.

Dachiku discloses a system of video coding the movement of a face from a sequence of images, comprising: coding the head (Dachiku: column 10, lines 60-65) from at least one of the images based (Dachiku: column 11, lines 40-45), at least in part, on a limited number of selected features points (Dachiku: column 10, lines 45-50) employing a three dimensional based coding technique to produce a three dimensional (3D) model (Dachiku: column (Dachiku: column 11,

lines 40-45); and estimating the movement of the head in the other images of the sequence using the 3D model of the head (Dachiku: column 10, lines 10-15) as in claim 19. However, Dachiku fails to discloses an imager and computing platform being coupled to communicate electronically, and an article comprising a storage medium having stored instructions thereon, which when executed by the computing platform result in the movement of a face from a sequence of images being coded, in claim 19. Kang discloses an imager (Kang: column 3,lines 20-40) and computing platform being coupled to communicate electronically (Kang: column 3, lines 45-60), wherein said computing platform being adapted so that, in operation, the movement of a face from a sequence of images is coded (Kang: column 4, lines 60-67) with the added advantage of a hands-free navigation system (Kang: column 3, lines 29-31). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in art to modify Dachiku's system by implementing it on the imager and computing platform of Kang in order to achieve a hands-free navigational capacity. The Dachiku system, now implemented on the imager and computing platform of Kang has a majority of the features of claim 19. However, the Dachiku-Kang combination fails to address having an article comprising a storage medium having stored instructions thereon, which when executed by the computing platform result in the movement of a face from a sequence of images being coded. Szeliski discloses an article comprising a storage medium having stored instructions thereon (Szeliski: column 8, lines 25-35), which when executed by the computing platform result in the movement of a face from a sequence of images being coded in order to efficiently produce parameter motion models (Szeliski: column 10, lines 25-65). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art to further incorporate the Szeliski article comprising a storage medium having stored

instructions thereon with the Dachiku-Kang combination in order to efficiently produce parameter motion models for the Dachiku system (Dachiku: column 20, lines 15-25). The Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon, has all of the features of claim 19.

Regarding claim 20, the Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon discloses treating the 3D model as a rigid body (Dachiku: column 11, lines 1-7), as in the claim.

Regarding claim 21, the Dachiku system, now implemented on the imager and computing platform of Kang and the Szeliski article comprising a storage medium having stored instructions thereon discloses that the movement of the head is estimated as translations and rotations based in part on estimates of spatio-temporal rates of change in intensity at the selected feature points (Dachiku: column 10, lines 30-40), as in the claim.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Steffens discloses face recognition from video images.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy S. Rao whose telephone number is (703)-305-4813. The examiner can normally be reached on Monday-Friday 8 hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris S. Kelley can be reached on (703)-305-4856. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-6606 for regular communications and (703)-308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-305-4700.

Andy S. Rao
Primary Examiner
Art Unit 2613

ANDY RAO
PRIMARY EXAMINER

asr
April 15, 2003